

CLAIMS**WHAT IS CLAIMED IS:**

1. An electric motor assembly, comprising:
a housing having a cavity:
at least one electric motor component disposed in the cavity; and
a thermally conductive fluid that fills the cavity to substantially submerge
said at least one electric motor component.
2. The assembly of claim 1, wherein said at least one electric motor
component comprises a motor selected from the group consisting of a permanent
magnet motor and a switched reluctance motor.
3. The assembly of claim 1, wherein said at least one electric motor
component comprises a rotor, a stator iron, and a stator winding.
4. The assembly of claim 3, wherein the housing further comprises a
partition separating the rotor from the stator iron and the stator winding,
wherein a space between an exterior portion of the partition and the housing
forms the cavity, and wherein the thermally conductive fluid fills the cavity to
substantially submerge at least one of the stator iron and the stator winding without
contacting the rotor.
5. The assembly of claim 1, wherein the thermally conductive fluid is a
dielectric fluid.
6. The assembly of claim 5, wherein the dielectric fluid is a dielectric
oil.

7. An engine starter system, comprising:
 - a housing having a cavity;
 - an electric motor housed in the cavity;
 - a dielectric fluid that fills the cavity to substantially submerge the motor; and
 - a rotor output shaft that couples the motor to an engine.
8. The system of claim 7, wherein the electric motor is a motor selected from the group consisting of a permanent magnet motor and a switched reluctance motor.
9. The system of claim 7, wherein the housing further comprises a partition separating the rotor from the stator iron and the stator winding,
 - wherein a space between an exterior portion of the partition and the housing forms the cavity, and wherein the thermally conductive fluid fills the cavity to substantially submerge at least one of the stator iron and the stator winding without contacting the rotor.
10. The system of claim 7, wherein the housing has a fluid inlet and a fluid outlet, and wherein the system further comprises:
 - a fluid pump that circulates the dielectric fluid through the fluid inlet into the cavity and out of the fluid outlet; and
 - a fluid reservoir that houses excess dielectric lubricant.
11. The system of claim 10, further comprising a heat exchanger that receives the dielectric fluid from the cavity and removes heat from the dielectric fluid.
12. The system of claim 10, further comprising a filter connected upstream of the housing to filter particles from the dielectric fluid before the fluid is sent into the cavity.